

July 28, 1970

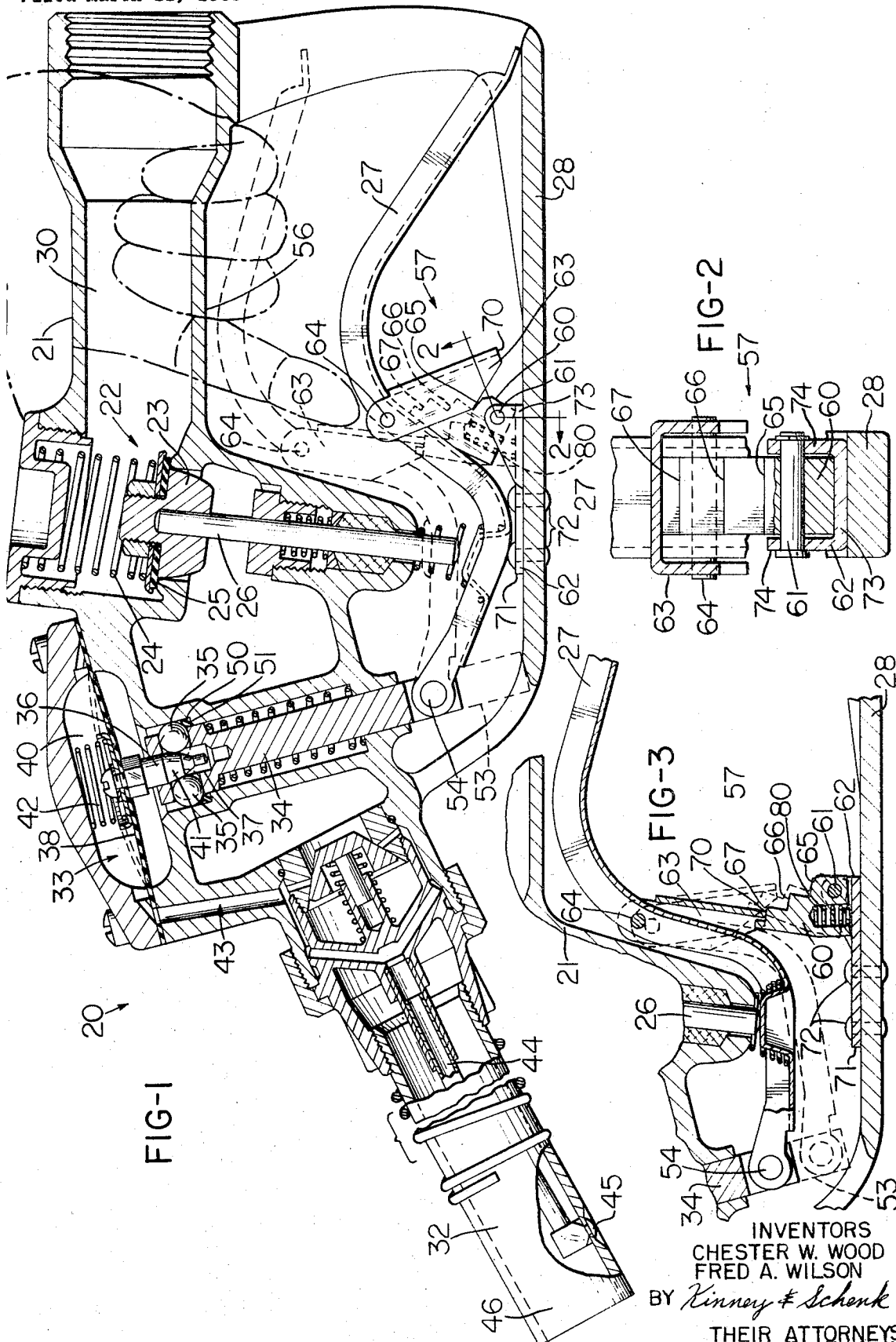
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3,521,680

FLUID DISPENSING NOZZLE

Filed March 11, 1968

2 Sheets-Sheet 1



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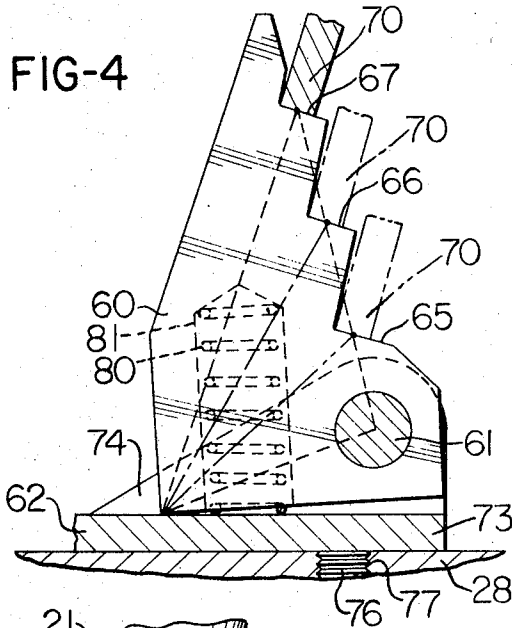
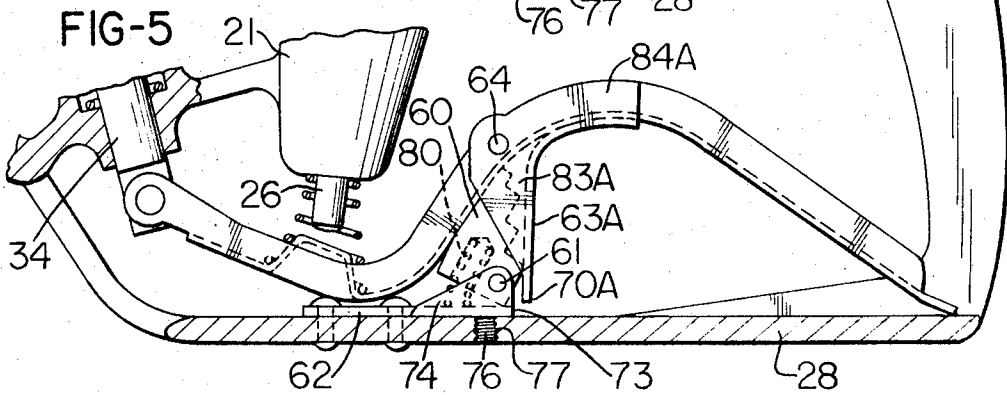
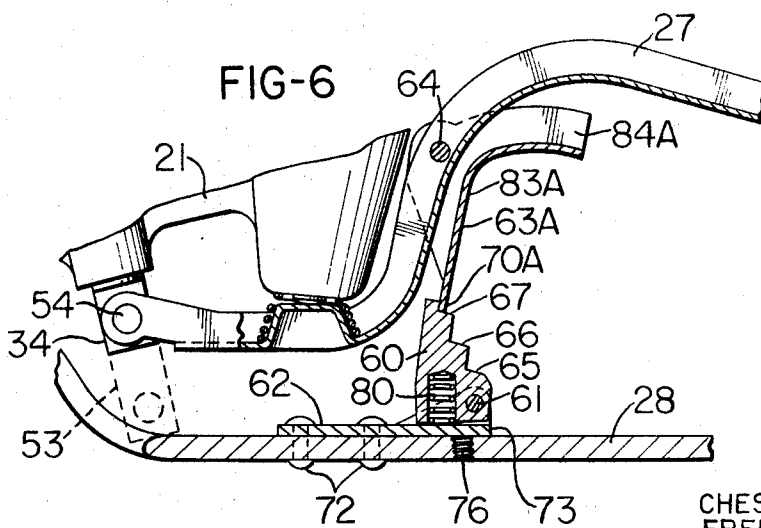
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2 Sheets-Sheet 2



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FLUID DISPENSING NOZZLE

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10 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a fluid dispensing nozzle of the type used to dispense liquids such as gasoline, or the like, wherein such nozzle has improved latch means for holding an actuating lever comprising such nozzle in an open position to enable leaving the nozzle unattended.

BACKGROUND OF THE INVENTION

Many presently used fluid dispensing nozzles of the type used to dispense gasoline, or the like, usually have provisions for latching the actuating lever for each nozzle in an open position to allow flow through the nozzle while leaving such nozzle unattended. However, the latches provided on presently used nozzles are difficult to actuate, often requiring that an operator use both hands to achieve such latching, and in many instances protrude outwardly of the peripheral outline of the nozzle so as to be susceptible to be readily engaged inadvertently and unlatched or caught on an operator's clothing to thereby create unnecessary problems during the dispensing of fluid through such present nozzles.

SUMMARY

This invention provides an improved fluid dispensing nozzle having latch means which are easy to latch in position using only one hand and provide a positive latching which holds the fluid nozzle positively open until such time as automatic shutoff means comprising the fluid nozzle is actuated whereupon a positive unlatching is provided with minimum wear of the component parts comprising such latch means.

Other details, uses, and advantages of this invention will become apparent as the following description of the embodiments thereof presented in the accompanying drawings proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings show present preferred embodiments of this invention, in which

FIG. 1 is a view of an exemplary fluid dispensing nozzle with parts in section and parts broken away and particularly illustrating such nozzle being actuated open using one hand and the improved latch means of this invention comprising such nozzle being actuated utilizing the index finger of the one hand;

FIG. 2 is a view on the line 2—2 of FIG. 1;

FIG. 3 is a view with parts in section and parts broken away particularly illustrating by solid lines the latch means in its full open position and illustrating by dotted lines the rack and locking trigger comprising the latch means after the locking trigger has skidded off of an associated step in the rack and prior to return of the actuating lever to the position illustrated in FIG. 1;

FIG. 4 is a fragmentary view particularly illustrating the rack comprising the latch means of this invention and the manner in which bearing surface means comprising the terminal end of the latching trigger engages various steps of the rack;

FIG. 5 is a view with parts in section and parts broken away illustrating another embodiment of a latching trigger

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which may be used on the fluid dispensing nozzle of FIG. 1 and showing such trigger in an unlatched position; and

FIG. 6 is a view with parts in section and parts broken away illustrating the trigger of FIG. 5 engaging the top step of the rack so that the actuating lever is in the fully open position.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

In the exemplary embodiment of this invention illustrated in FIG. 1 of the drawings, an improved fluid dispensing nozzle such as a gasoline dispensing nozzle 20 is illustrated. Dispensing nozzle 20 is comprised of a main housing means or body 21 having normally closed valve means indicated generally by the numeral 22 supported within body 21.

Valve means 22 comprises a poppet valve 23 which is normally urged closed by a spring 24 against a co-operating seat 25 provided in housing 21. Poppet valve 23 has a stem 26 fixed to the lower end thereof. The lower end of stem 26 is normally engaged by a suitably pivoted lever 27 to override spring 24 and thus open valve means 22.

The pivoted lever 27 used to open valve means 22 will be described in more detail subsequently in this specification; however, lever 27 is provided with a suitable lever guard 28 which extends beneath main housing 21. The lever guard 28 may be a separate unit suitably fastened in position or may be formed as an integral part of housing 21. The lever guard is so constructed and arranged that lever 27 is confined within the peripheral outline of guard 28.

A passage 30 is provided in housing 21 and such housing has means such as threads or the like at the entrance to passage 30 for connection of nozzle 20 to a flexible hose, or the like, which in turn is connected to a source of gasoline through a gasoline metering pump. A fluid discharge conduit 32 is also suitably connected to the discharge end of nozzle 20 and upon actuating lever 27, with nozzle 20 inserted in a gasoline tank, for example, stem 26 and hence poppet 23 is raised upwardly allowing gasoline to flow through passage 30 and out of nozzle 20 through its discharge conduit 32.

Gasoline dispensing nozzle 20 includes automatic shutoff means enabling leaving nozzle 20 unattended. The automatic shutoff means shuts off the flow of gasoline through nozzle 20 once an associated gasoline tank has been filled so that the discharge end portion of conduit 32 is submerged by gasoline.

The automatic high-level shutoff means used in nozzle 20 is of a known type and is designated within nozzle 20 generally by the numeral 33. Shutoff means 33 comprises a telescoping cylindrical plunger 34 mounted within housing 21 for axial movement within confined limits. Plunger 34 has radial openings in one end portion thereof, shown in the upper end portion in this example, and a plurality of balls 35 carried within such radial openings for radial movement toward and away from the elongated axis of plunger 34. The balls 35 operate to hold the plunger 34 in a raised position upon being urged radially outwardly by a cooperating stem 36 extending through a blind bore 37 in the central portion of plunger 34 as will be presently described.

Stem 36 is suitably centrally fastened to a diaphragm 38 which is carried within housing 21 to define a pressure chamber shown at 40. Stem 36 has a tapered portion illustrated at 41 which serves as cam surface means adapted to engage balls 35. A balance spring 42 is provided on the top side of diaphragm 38 for controlling the extent of movement of such diaphragm and hence the movement of tapered portion 41 and balls 35.

Nozzle 20 also has a separate passage means designated generally by the numeral 43 and extending from a

location adjacent the terminal discharge end of discharge conduit 32 so that it is in flow communication with pressure chamber 40. Passage means 43 is comprised of a plurality of suitably interconnected integral passages each extending through an associated portion of nozzle 20. The lower end portion of passage means 43 is defined by a section of separate tubing 44 supported within discharge conduit 32 and tubing 44 has an open end portion or open end 45 extending through conduit 32 adjacent its discharge end as shown at 46 so that open end 45 is submerged once an associated tank is nearly filled.

During a normal filling operation, with a tank not yet full, the pressure within chamber 40 is such that tapered portion 41 urges balls 35 outwardly so that they engage an O-ring or seat ring 50 supported on a shoulder 51 provided in housing 21, thus holding plunger 34 in its raised position. This is the solid line position shown in FIG. 1.

As the tank or container is filled during such normal filling operation, liquid submerges the terminal end portion of arcuate discharge conduit 32 also submerging open end 45 of tubing 44 to cause a reduction in pressure in the entire passage means 43. Because passage means 43 is in flow communication with chamber 40, the reduced pressure is also present in chamber 40 which allows diaphragm 38 to move upwardly to the dotted line position of FIG. 1 causing balls 35 to roll toward each other to the dotted line position shown and thereby releasing or unlocking plunger 34 from its raised position as held by balls 35 being seated against seat ring 50.

As plunger 34 is released it telescopes downwardly or drops to a lower dotted line position shown at 53 in FIG. 1 and thereby drops a pivot pin 54 carried at its lower terminal end.

Pivot pin 54 supports one end of lever 27 for pivoting movement thereabout. With pivot pin 54 dropped to position 53, the upper portion of lever 27 strikes housing 21 at 56 upon being actuated making it physically impossible for lever 27 to contact the terminal end of rod 26 and allow flow through poppet assembly 23. It will be appreciated that once the mechanical assembly associated with plunger 34 drops to position 53 spring 24 immediately urges poppet assembly 23 closed.

The automatic shutoff means described in connection with nozzle 20 operates in an efficient manner irrespective of whether the nozzle 20 is manually held within an associated tank while holding lever 27 open or whether nozzle 20 is left unattended by utilizing the improved latch means of this invention, which is designated generally by the reference numeral 57.

The latch means 57 is comprised of a first member or rack 60 which is supported for pivoting movement about a first pivot pin 61 supported by a support 62 which is fastened to lever guard 28 and a second member comprised of a latching trigger 63 which is supported for pivoting movement about a pivot pin 64 carried by actuating lever 27.

The rack 60 has a plurality of locking step means shown in this exemplary embodiment as three locking step means or locking steps designated by the reference numerals 65, 66, and 67 respectively and the latching trigger 63 has a bearing surface means 70 defining its terminal lower end. The bearing surface 70 is adapted to engage each of the three steps 65, 66, or 67 to hold the actuating lever 27 at three corresponding positions which represent three conditions of fluid flow. In particular, it will be seen that the lower step 65 provides a low flow condition through the dispensing nozzle 20, the intermediate step 66 provides an intermediate flow condition, and the step 67 provides a high flow condition upon being engaged by the bearing surface 70 at the terminal end of trigger 63.

The latch means 57 of this invention is latched open after manually actuating lever 27 and following the insertion of the discharge conduit 32 in an associated tank. At this point the telescoping plunger 34 is in a raised position

and the dimensional arrangement and configuration of rack 60 and trigger 63 is such that irrespective of which step 65, 66, or 67 the bearing surface 70 is engaged against an over-center linkage arrangement (or stated otherwise, an over-center condition with respect to pivot pins 61 and 64) is defined which holds the lever 27 in a raised or open position to simultaneously open and allow flow through the valve means 22 of nozzle 20.

Once the automatic shutoff means is actuated by the fluid level within the associated tank submerging open end 45 of conduit 44 the plunger 34 drops to its lower position shown at 53, as previously described, thereby carrying pivot pin 54 and the pivoted end of lever 27 therewith. As the pivoted end of lever 27 moves to position 53 the location of pivot pin 64 supporting trigger 63 also changes whereby the above described over-center condition is changed and the bearing surface 70 is repositioned with respect to the step on which it was resting so as to release the bearing surface 70 from such step and unlatch the latch means 57.

The unlatching action is such that the bearing surface 70 instead of tending to exert a force against rack 60 which will hold the latch means 57 open will now act in a direction which tends to open latch means 57 and the opening action is such that there is a minimum of wear of the bearing surface 70 and the steps 65-67.

As will be apparent from FIG. 4 of the drawings with the plunger 34 in its raised position the over-center condition is defined in this example of the invention by the bearing surface 70 engaging each step 65, 66, or 67 so as to apply a force at an angle to a straight line between the pivot pins 61 and 64. The angle at which the force is applied is also controlled by the angular relationship of bearing surface 70 and of each step 65-67 and is such that the trigger 63 normally tends to remain locked until plunger 34 drops to its lower position when actuated by the automatic shutoff means.

The support 62 which supports pivot pin 61 and hence the rack 60 for pivoting movement thereabout is comprised of a resilient member which has one end 71 suitably fixed to the lever guard 28 by a pair of rivets each designated by the reference numeral 72. The opposite end 73 of support 62 is substantially U-shaped, see FIG. 2, and may be resiliently flexed within guard 28.

The rack 60 is supported about pivot pin 61 for pivoting movement between the outwardly extending leg portions each designated by the same reference numeral 74 of U-shaped end portion 73. A threaded rack adjusting screw 76 is provided and extends through a cooperating threaded opening 77 in the lower portion of guard 28 and screw 76 is threaded so that it engages the lower surface of end portion 73 of support 62 to urge end portion 73 inwardly away from the lever guard 28 and thereby change the position of pivot pin 61 and control the pivoting movement of the rack 60 about pivot pin 61.

The support 62 is slightly flexible and resilient in character, as previously indicated, so that as adjusting screw 76 is moved away from end portion 73 such end portion tends to return to its original position against the lever guard 28. It will be appreciated that by changing the position of rack 60 relative to trigger 63 it is possible to change the angle of the various steps 65-67 and thereby control the ease with which the over-center condition previously described is changed once the plunger 34 moves to its lower position.

Latch means 57 also has a compression spring 80 which yieldingly acts between support 62 and hence the lever guard 28 and the rack 60. The compression spring 80 is received within a blind bore 81 provided within the rack 60 and tends to urge the rack 60 in a clockwise direction about its pivot pin 61 and as the over-center condition is corrected, once the plunger 34 drops to its lower position 53, the spring 80 tends to instantaneously disengage the

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bearing surface 70 from the associated step means on which it was resting.

As previously indicated the trigger 63 is supported for pivoting movement about pivot pin 64 which is fastened in position on lever 27. The trigger 63 is a channel-shaped member having a substantially U-shaped cross-sectional configuration along its central portion and is fastened in position so that the parallel leg portions of its U-shaped configuration are arranged on opposite sides of the lever 27. The lower edge of the bight or base portion of the substantially U-shaped configuration trigger 63 is adapted to engage step 65-67 and comprises bearing surface 70.

The trigger 63 is, in effect, pivotally suspended beneath and by pivot pin 64 so that it may be easily pushed forward by an index finger as illustrated by the dotted line presentation of FIG. 1. The trigger 63 of this example is suspended so that it is acted upon solely by the action of gravity. However, it will be appreciated that a spring or the like, may be utilized which would tend to normally rotate or pivot the trigger 63 about its pivot pin 64, as desired.

Another exemplary embodiment of a trigger is illustrated in FIGS. 5 and 6 of the drawings. The trigger of FIGS. 5 and 6 is very similar to the trigger 63; therefore, the trigger of FIGS. 5 and 6 will be designated by the same reference numeral 63 followed by the letter designation A and component parts thereof will be designated by the same reference numeral as similar parts of trigger 63 also followed by the letter designation A. The triggers 63 and 63A operate in a substantially identical manner and trigger 63A may be substituted for trigger 63 in the nozzle 20; therefore, a detailed description of the operation of dispensing nozzle 20 utilizing trigger 63A will not be repeated.

As will be apparent from FIGS. 5 and 6 the trigger 63A is substantially L-shaped having a pair of leg portions 83A and 84A and is pivotally supported by the pivot pin 64 adjacent the intersection of its leg portions 83A and 84A. The L-shaped arrangement of trigger 63A is controlled so as to enable easy actuation of trigger 63A and placement of its terminal bearing surface means 70A on the various steps 65, 66, or 67 of the rack 60.

The improved latch means of this invention is particularly adapted to enable installation on existing fluid dispensing nozzles and it is only necessary to provide the cooperating component parts defining the latch means and attach such cooperating component parts to the lever guard and to the lever.

Terms such as "upwardly," "downwardly," "inwardly," "outwardly," and the like have been used in this specification for ease of description and to correspond to the arrangement of the various component parts as illustrated in the drawings and such terms should not be considered as limiting the scope of this invention in any way.

Thus, it is seen that improved latch means have been provided by this invention which are easily actuated by one hand, are of simple and economical construction, and provide latching and unlatching with minimum wear of component parts.

While present exemplary embodiments of this invention have been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced within the scope of the following claims.

What is claimed is:

1. A fluid dispensing nozzle for dispensing a fluid into a fluid container comprising, a housing, valve means supported within said housing and adapted to be opened to allow fluid flow through said nozzle, said valve means including urging means normally urging said valve means closed, a fluid discharge conduit fastened in flow communication with said valve means and adapted to have its terminal end portion submerged in fluid upon filling said container, automatic shutoff means for au-

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tomatically shutting off flow through said valve means as said end portion of said conduit is submerged in said fluid, said automatic shutoff means including a telescoping plunger which moves to an extended position upon actuation of said automatic shutoff means, a lever for opening said valve means and having one end pivoted on said plunger, a lever guard on said housing and having said lever arranged within the confines thereof, and latch means for latching said lever open upon overriding said urging means to allow fluid flow through said valve means prior to actuation of said automatic shutoff means, said latch means being arranged within the outline of said lever guard and being adapted to be actuated using only one hand and comprising a first member supported solely by said lever guard, a second member supported on said lever, one of said members having locking step means and the other said members having a bearing surface adapted to be supported on said step means, and with said plunger in its retracted position prior to automatic shutoff of said valve means said bearing surface engages said step means and creates an over-center condition which holds said lever in a raised position and said valve means open and upon actuation of said automatic shutoff means and movement of said plunger outwardly said one pivoted end of said lever moves therewith changing said over-center condition thereby releasing said bearing surface means from its step means to assure a positive unlatching of said latch means substantially free of wear between said bearing surface means and step means.

2. A fluid dispensing nozzle as set forth in claim 1 in which, said first member comprises a rack supported for pivoting movement about a first pivot pin carried by said lever guard, said rack comprises a plurality of said locking step means, said second member comprises a trigger supported for pivoting movement about a second pivot pin on said lever and having said bearing surface means defining its lower end, and said over-center condition is defined by said bearing surface means engaging an associated one of said step means so as to apply a force at an angle to a straight line between said pivot pins which tends to lock said trigger and rack in position.

3. A fluid dispensing nozzle as set forth in claim 2 and further comprising a compression spring yieldingly acting between said lever guard and said rack and normally tending to instantaneously disengage said bearing surface means from an associated step means once said over-center condition is corrected upon movement of said plunger outwardly.

4. A fluid dispensing nozzle as set forth in claim 2 further comprising a resilient support having one end fastened to said lever guard and its opposite end carrying said first pivot pin and an adjusting screw for engaging and adjusting said opposite end of said support by slight flexing thereof relative to said lever guard to thereby adjust the position of said rack and the angle of said step means relative to said lever guard and control the point at which said over-center condition is changed.

5. A fluid dispensing nozzle as set forth in claim 4 in which said opposite end of said support is substantially U-shaped and said rack is supported by said first pivot pin for pivoting movement between the upwardly extending leg portion of the U-shaped opposite end.

6. A fluid dispensing nozzle as set forth in claim 2 in which said trigger is pivotally suspended beneath said second pivot pin and acted upon solely by gravity, said second pivot pin being positioned on said lever so that said trigger may be easily pushed forward by an index finger.

7. A fluid dispensing nozzle as set forth in claim 2 in which said trigger is substantially straight and has a central portion of U-shaped cross-sectional configuration.

8. A fluid dispensing nozzle as set forth in claim 2 in which said trigger is substantially L-shaped and is pivotal-

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ly supported by said second pivot pin adjacent the intersection of its leg portions.

9. A fluid dispensing nozzle as set forth in claim 2 further comprising a compression spring yieldingly acting between said lever guard and said rack and normally tending to instantaneously disengage said bearing surface means from an associated step means once said over-center condition is corrected upon moving said plunger outwardly, a resilient support having one end fastened to said lever guard and its opposite end carrying said first pivot pin, and an adjusting screw for adjusting said opposite end of said support by engaging said opposite end with the terminal end of said screw and slightly flexing said opposite end relative to said lever guard to thereby adjust the position of said rack and the angle of said step

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means relative to said lever guard and control the point at which said over-center condition is changed.

10. A fluid dispensing nozzle as set forth in claim 9 in which said trigger is pivotally suspended beneath said second pivot pin and acted upon solely by gravity, said second pivot pin being positioned on said lever so that said trigger may be easily pushed forward by an index finger.

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